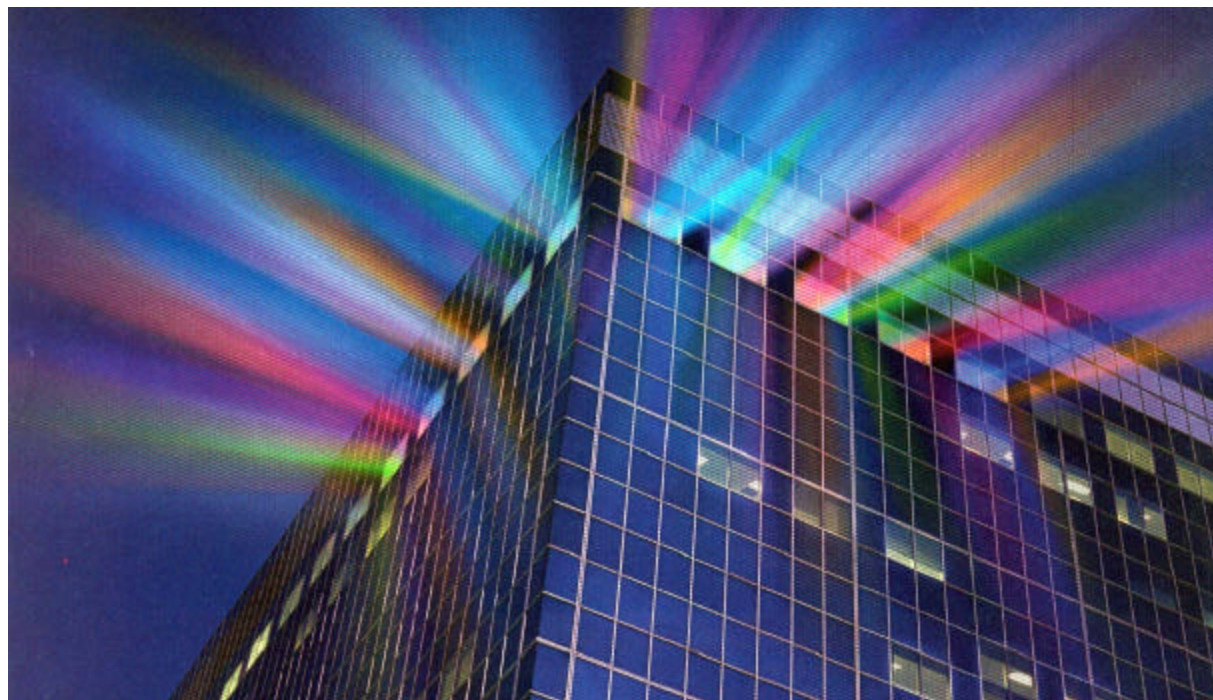


# Knowledge Management in Specialty Chemicals R&D



*Building the Library of the Future*

**David A. Breiner**

Cytec Industries

ICIC – Nimes, France

October 24, 2006

**CYTEC**

# Quote

“Small or large, the mission of the company library is the same: To select, obtain, store, and disseminate pertinent technical information to those who need it, as rapidly and efficiently as possible.”

Harold S. Sharp, Technical Librarian  
General Motors, A.C. Spark Plug Division  
*Industrial Laboratories*, November 1959

*Libraries have always been essential to  
Knowledge Management in R&D.*

# Outline

- Provide an overview of Cytec
- Review our Knowledge Management initiative in Specialty Chemicals R&D
- Discuss organizational challenges
- Share our lessons learned
- Share our vision for the future
- Answer your questions

# CYTEC

*Technology ahead of its time™*

<http://www.cytec.com>



Cytec Industries Inc. is a global specialty chemicals and materials company focused on developing, manufacturing and selling value-added products. Our products serve a diverse range of end markets including aerospace, adhesives, automotive and industrial coatings, chemical intermediates, inks, mining and plastics. We use our technology and application development expertise to create chemical and material solutions that are formulated to perform specific and important functions in the finished products of our customers.

**Founded in 1993 as a spin-off from American Cyanamid**

**CYTEC**

# Cytec Businesses



**David Lilley**  
Chairman, President & CEO,  
Cytec Industries Inc.

**Cytec  
Engineered  
Materials**

**Building Block  
Chemicals**

**Cytec  
Specialty  
Chemicals**



**Steve Speak**  
President, CEM

**17%**



**Jas Gill**  
President, BBC

**9%**



**Shane Fleming**  
President, CSC

**74%**

**2005 Pro Forma Sales = \$3.2B USD**

**CYTEC**

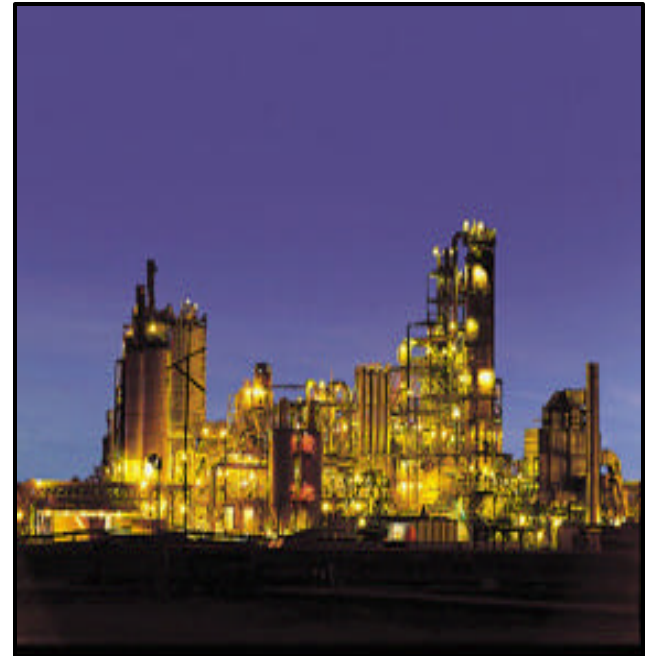
# Cytec Engineered Materials

- 2005 Pro Forma Sales = \$542M
- Global technology leader in advanced materials for aerospace and other extreme-demand environments:
  - High-performance composites and adhesives
  - Ablatives
  - Carbon materials for high-temperature applications
  - High-temperature silicone-based sealants
  - Specialty thermoplastic materials
  - PAN and pitch-based carbon fibers
  - Vacuum-only-cure prepregs
  - Anti-ballistic materials for cockpit doors and commercial aircraft
- Ten advanced manufacturing facilities and four technology centers in the U.S. and Europe



# Building Block Chemicals

- 2005 Pro Forma Sales = \$284M
- Major producer of chemical raw materials and intermediates:
  - Acrylonitrile
  - Acrylamide Monomer
  - Melamine
  - Methyl Methacrylate
  - Sulfuric Acid
- Production facilities:
  - New Orleans, Louisiana
  - Rotterdam, The Netherlands



Acrylamide business sold to Kemira on October 2, 2006

# Cytec Specialty Chemicals

- **2005 Pro Forma Sales = \$2.5B**
- **Approximately 4,500 employees**

**Amino Crosslinkers  
for Coatings**

**Coating Additives**

**Amino resins for  
Tires, Textiles, Bonding  
& Laminating**

**Phenolics &  
Unsaturated Polyesters**

**Radiation Curable  
Resins for Coatings &  
Inks**

**Polyester Resins for  
Powder Coatings**

**Alkyd, Acrylic, Epoxy,  
Phenolic, Polyurethane  
resins for Liquid  
Coatings**

**Specialty Urethanes**

**Mining Chemicals**

**Specialty Additives**

**Phosphines**

**Polymer Additives**

**Pressure Sensitive  
Adhesives**

**Broad Portfolio Offering Excellent Growth Potential**



# Cytec Surface Specialties (CSS)

**Approximately 2,800 employees**

- # 1 in UV/EB curable systems (RADCURE)
- # 1 in powder coating resins
- # 1 in waterborne alkyd resins
- # 1 in acrylics in Europe, merchant market
- # 1 in waterborne epoxies
- # 1 in resins for waterborne systems in primer base coat for automotive OEMs
- # 1 in phenolics in Europe



Acquired from UCB for \$1.8B on March 1, 2005

# Cytec Performance Chemicals (CPC)

**Approximately 1,700 employees**

- **#1 in specialty mining reagents and flocculants**
- **#1 phosphine and derivative chemicals**
- **Leading global supplier of polymer additive UV light stabilizers**
- **Leading global supplier of specialty additives for emulsion polymers, inks, adhesives and acrylic monomer stabilization**
- **Leading supplier of specialty pressure sensitive adhesives**



**Water Treatment business sold to Kemira on October 1, 2006**

# Cytec Specialty Chemicals R&D

- Dedicated research centers in Austria, Belgium, Brazil, Canada, Chile, China, Germany, Italy, Japan, Malaysia, Singapore, South Korea, Thailand, United Kingdom, United States
- Add value to customers by developing new products for unmet needs
- Over 300 patent families granted to Specialty Chemicals businesses
- Goal: 25% "Vitality Index" (revenue generated by products introduced within past 5 years)



Drogenbos, Belgium



Stamford, CT USA

**Strong Commitment to Research & Development**

Why do we need  
Knowledge Management (KM)  
in Specialty Chemicals R&D?

# 2002

- Stamford site undergoing \$50M renovation
- R&D groups report to business VPs and “manage” their documents separately
- No centralized document repository
- Difficult retrieval of internal information
- Limited external information resources
- Stamford Library relocates to smaller facility, has no manager, and considered obsolete by its users



Stamford Library  
1938

**Loss of  
in-house  
knowledge**

**Obsolete  
Library**

**Paper, email, &  
hard drive  
files**

**We needed  
KM!**

**Decreased  
productivity**

**Information  
silos**

**Limited  
sharing of  
best practices**

# 2003

- New Library Manager hired in June reporting to new VP R&D
- Stamford Library renamed to “Technical Information Center” (TIC) and redesigned with 50% less shelves
- New Associate Information Scientist hired in November
- KM Project launched including Virtual Library with limited external resources
- TIC Mission and Vision developed



# TIC Mission

Be a premier **Technical Information Center**, enabling Cytec Specialty Chemicals to achieve targeted sales of new and existing products by:

- (1) Partnering with R&D and other key customers
- (2) Leveraging appropriate technology to search, archive, and disseminate internal data and documents and external published information in a cost-effective, user-friendly manner
- (3) Providing a center for learning, idea exchange, and innovation



**Our Logo**

**Technical Information Center**

*Knowledge for technology ahead of its time*

**CYTEC**

# KM Project

- Design and implement processes and supporting systems to effectively document, archive, and retrieve relevant technical information across Cytec Specialty Chemicals R&D.
- Design and implement the “Library of the Future” to enable our scientific community to acquire the knowledge necessary to discover advanced technology.
- Deliver value-added information services globally.

*Get the **Right Information** to the  
**Right People** at the **Right Time!***

# KM Project

- **Sponsor:** Dr. Joseph Kozakiewicz (VP R&D)
- **Leader:** David Breiner
- **Team Members:** Representatives from each R&D group with Legal and IT support
- **Timeline:** July 2003 – December 2005
  - July–December 2003: “As Is” Analysis and Design Requirements
  - January–April 2004: “To Be” Design
  - May 2004: Approval by VP R&D, R&D Leaders, and Legal Department
  - June–December 2004: 3 Phase Implementation
  - January–December 2005: Institutionalization

***People lead...Processes guide...Tools enable***

# KM Design Requirements

- **Single portal** for internal and external information
- Utilize **existing tools** and **infrastructure** available within Corporate IT
- **Globally accessible** and **secure**
- Leverage **electronic** capabilities
- **User friendly** with minimal training
- Utilize **best practice** processes
- **Standardize** systems, processes, and tools
- **Minimize** administration
- Aligned with Corporate **Record Retention** policies

*Remain budget neutral !*

# KM Scope: Internal Information

- Analytical Work (LIMS)
- Filed Patent Applications
- Formal Research Reports
- Laboratory Notebooks
- Monthly Reports
- New Product Development
- Non-Disclosure Agreements
- Technical Service Reports
- Technical Presentations
- Trip Reports

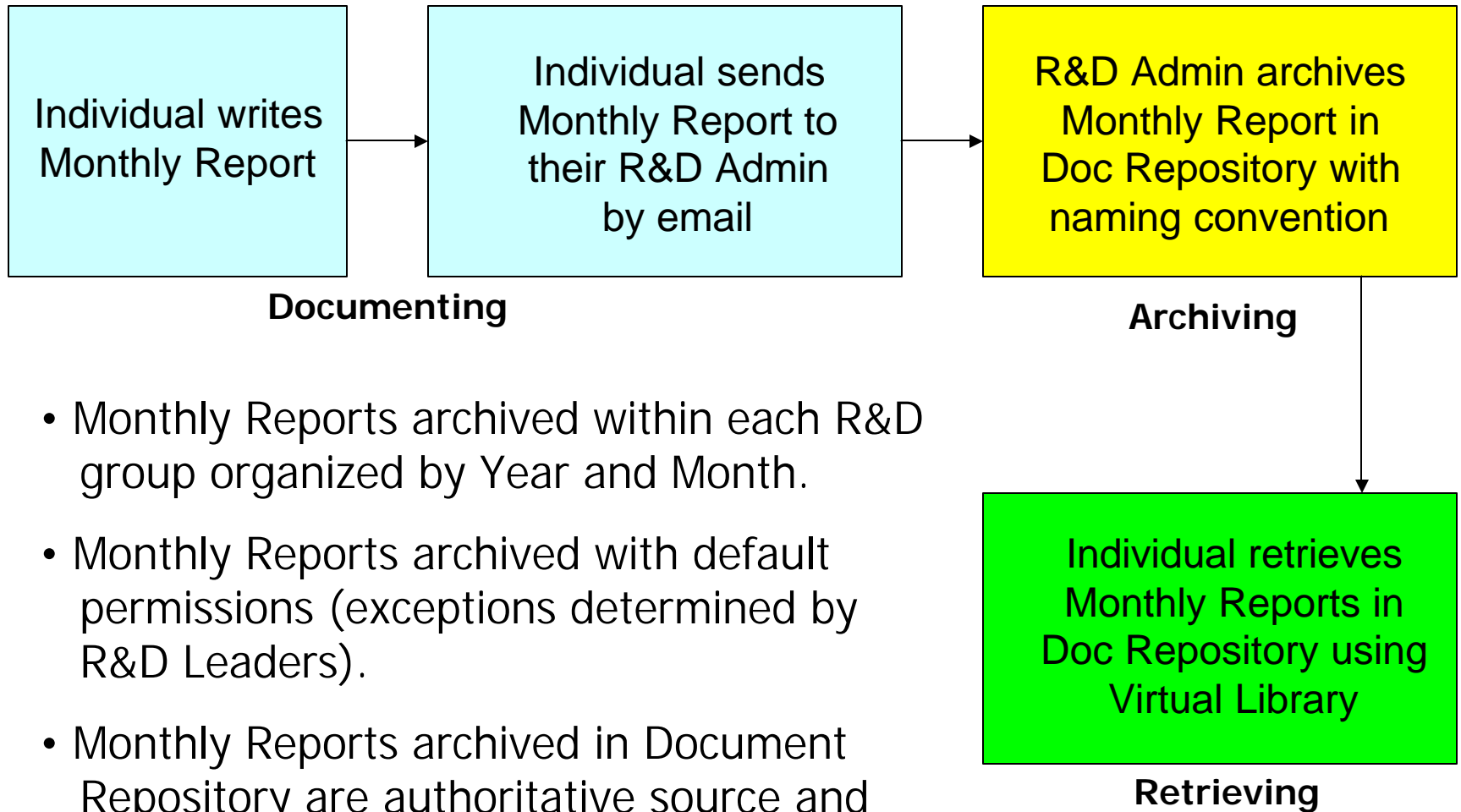
# KM Scope: External Information

- Cytec Published Patents
- Cytec Published Journal Articles
- Prior Art & Literature Searches
- Competitor Literature & Patents
- Journals
- Books
- Technical Standards
- Market Research
- Websites

# Implementation: Internal Information

- Policies and Procedures designed and implemented by KM Team
- DocuShare (Xerox) utilized as centralized repository available from Virtual Library
- Architecture and permissions owned and managed by TIC
- R&D group documents (Monthly Reports, Technical Presentations, Project Documents, Trip Reports, etc.) archived by designated content managers
- Centralized documents (Research Reports, Cytec Publications/Patents, Notebooks) archived by TIC

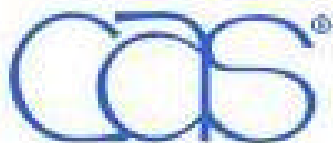
# Sample Process: Monthly Reports



- Monthly Reports archived within each R&D group organized by Year and Month.
- Monthly Reports archived with default permissions (exceptions determined by R&D Leaders).
- Monthly Reports archived in Document Repository are authoritative source and are fulltext searchable.



# Implementation: External Information

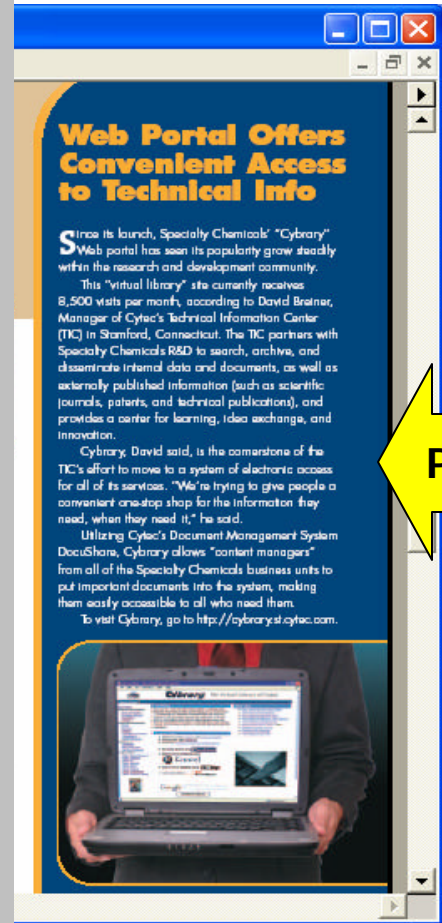
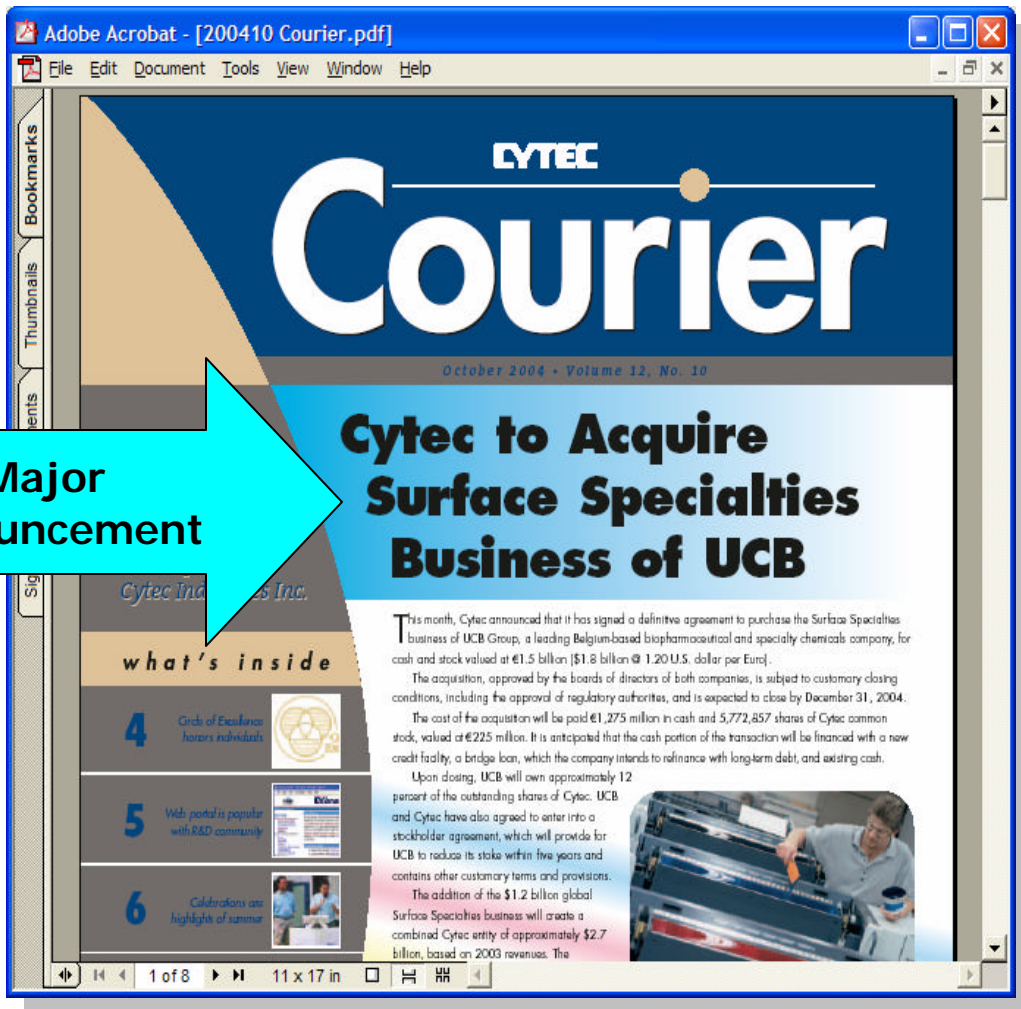


TELTECH.



*Most external resources acquired over 3 years*

# October 1, 2004



*Largest acquisition in Cytec's history*

**CYTEC**

# 2005

- Cytec completes acquisition of Surfaces Specialties from UCB on March 1
- Center for Information for Technology and Marketing (CITM) in Brussels continues to support CSS division
- Technical Information Center (TIC) continues to support CPC division
- TIC and CITM collaborates on several external resources
- TIC providing external information to Engineered Materials and Building Blocks
- TIC is a hub for cross-functional R&D activity in Stamford

# Stamford R&D Community



## Poster Sessions and Seminars



# Testimonials

- *...a simple user-friendly resource for easy and convenient access to a variety of useful information. – Analytical*
- *...provides essential technical and marketing information not readily available to us in the past. – Polymer Additives*
- *...has effectively increased the quantity and quality of my ideas. – Water Treating*
- *...has changed what was once an information hunt to a knowledge flow. – Mining*

# 2005 Organizational Changes

- Cytec announces integration of Surfaces Specialties and Performance Chemicals divisions on October 26
- CITM and TIC report to new Innovation Process Director starting in November
- Innovation Process group reports to Specialty Chemicals R&D VP
- CITM and TIC combined to form "Cytec Information Center" (CIC) in December

# 2006

- CIC integrates resources and budget
- CIC conducts user survey and focus groups to develop 4-Year Strategic Plan
- New Innovation Management system and processes designed and launched
- Virtual Library redesigned and launched
- CIC reorganized by function to reflect global service organization:
  - Intellectual Property & Information Analysis (led by Frederic Baudour)
  - Knowledge Management (led by David Breiner)



**Our New Logo**

**CYTEC**  
Information Center  

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KNOWLEDGE FOR INNOVATION

**CYTEC**

# New CIC Organization

- Intellectual Property and Information Analysis:
  - Value-added searches (prior art, patentability, freedom to operate, infringement, landscaping)
  - End-user tools and support
- Knowledge Management:
  - External Resources (subscriptions, document requests)
  - Internal Resources (document management, information architecture)
- Technical Exchange:
  - Events (seminars, workshops, poster sessions)
  - Internal Expertise Network
  - eCollaboration



# CIC Team



**CYTEC**  
Information Center  
KNOWLEDGE FOR INNOVATION

**CYTEC**

# CIC Vision

Provide state-of-the-art, value-added information services that will enable Cytec to discover, develop, and market new and improved products and technologies in order to sustain competitive advantage across all of its businesses.

- *Connect* our scientists to the right information at the right time in the right format
- *Enhance* our scientists' productivity to foster innovation and collaboration
- *Expand* our scientists' knowledge and expertise to enable the best possible decisions

# CIC Future Challenges

## Short Term:

- Complete CIC Integration and Strategic Plan
- Leverage global licenses across CSC R&D for external information resources
- Increase capabilities for IP analysis

## Long Term:

- Acquire appropriate information to support innovation and growth
- Facilitate leveraging of technical knowledge and expertise (communities of practice, events, virtual “coffee stations”)
- Assist other key functions with information needs (marketing, manufacturing, safety, etc.)

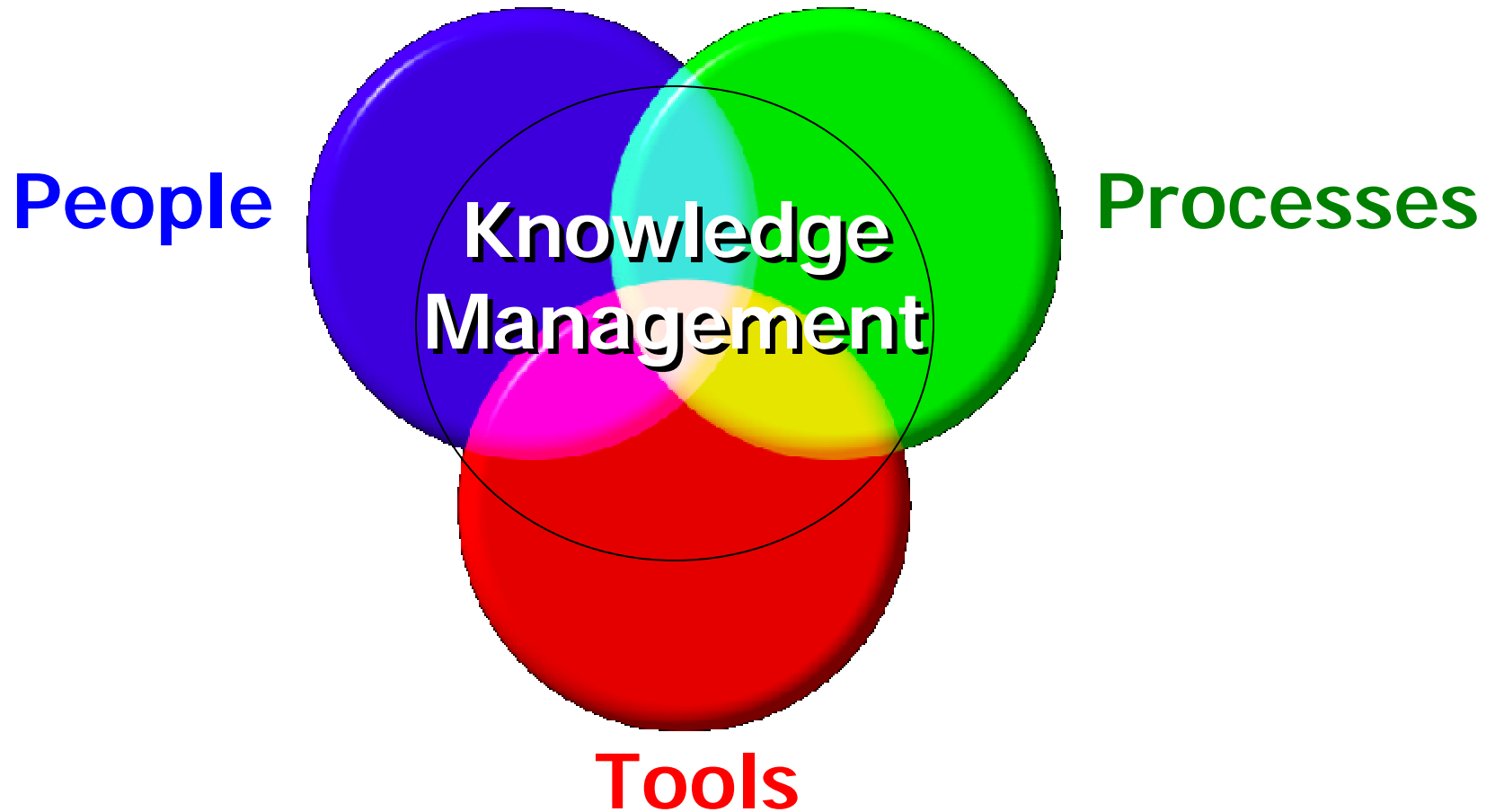
# Lessons Learned

- Align KM directly to your business model
- Focus on people and processes, not tools
- Start small, then expand your reach
- Select appropriate external information resources
- Continuously monitor, evaluate, and improve services

# Lessons Learned

- Be fully supported by senior management and key stakeholders
- Embrace change as opportunity
- Culture change takes time
- If you feed them, they will come
- Have a clear vision and a compelling mission

# Summary



*Knowledge Management is critical to increasing and maintaining our competitive advantage.*

# Acknowledgements

- **CSC Innovation Process Director**  
Wim Vanderpoorten
- **CSC R&D Vice Presidents**  
Martin Court, Jan Vandendriessche, Joseph Kozakiewicz
- **Cytec Information Center (CIC) Team**  
Frederic Baudour, Teresa Fernandez, Maria Cappadona, Dana Moore, Susan Telesco, Isabelle Urbain, Bart Vanachter
- **Knowledge Management Project Team**  
Jeanne Courter (Coatings), Leonard Davis (Polymer Additives), Raymond Farinato (Water Treating), Steven Greenhouse (Analytical), Nimal Jayasuriya (Specialty Additives), James Jubinsky (Patent), John Hillhouse (Phosphines), Wilfred Perez (Mining), Gary Walters (IT)
- **Information Technology**  
Rich Hagan, Peter Kefali, Tariq Rahman
- **Corporate Communications**  
Dana Poncioli
- **CSC R&D Community**  
R&D Leaders, Research Fellows, Scientific Advisor, many others...

# Answer Your Questions



CIC Europe (Drogenbos)



CIC North America (Stamford)

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